MULTIMEDIA UNIVERSITY

STUDENT IDENTIFICATION NO

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FINAL EXAMINATION

TRIMESTER 1, 2018/2019

BKC3034 – BUSINESS SYSTEMS ANALYSIS AND DESIGN

(All Sections / Groups)

13 OCTOBER 2018
2:30 p.m. – 4:30 p.m.
(2 Hours)

INSTRUCTION TO STUDENTS

1. This paper consists of 6 pages with **TWO** sections only.
2. Answer **ALL** questions in Section A and Section B. The distribution of marks for each question is given.
3. Please write all your answers in the answer script provided.

SECTION A: CASE STUDY

Answer ALL questions.

Fairchild Pharmaceuticals: Finalizing Architectural Design for a Production System

James Schultz is a summer intern with Fairchild Pharmaceuticals. For the past two weeks, he has been assigned to an ongoing development project for a production scheduling and control system. The project was nearing a point when critical design and deployment decisions were needed. Sufficient requirements had been identified through analysis activities to know what was required in the solution.

James works for Carla Sanchez, the chief analyst and project manager. For the past two weeks, James has been shadowing Carla as she finished prioritizing the identified functional requirements. He helped Carla prepare presentations to the project oversight committee and system users. He has absorbed a lot of information about the project in a short time, but the details and overall project direction haven't yet formed a coherent picture in his mind. Yesterday, the oversight committee signed off on the work to date, so Carla asked James to stop by her office the next morning to discuss his assignment for the next project phase.

At Carla's office the next day, James said, "I have two questions that I think are related. The first is, which implementation details have been decided and which haven't? The discussions with the users and oversight committee left me with the impression that the decision to go with a full-blown Web-based system had already been made. Yet none of the supporting infrastructure for a Web-based system currently exists, or does it?".

Carla replied, "A few elements are in place, but most of it will need to be designed and acquired. But let's hear your other question before we get into that."

James continued, "Well, you've sort of anticipated my next question, which is, what do we need to do next? There seem to be several important tasks that need to be started now, such as choosing system software to support Web services, determining what changes will be needed to the company network, and designing the database. But I suspect that I've left out a few important pieces. Also, the tasks and decisions are so interdependent that I don't know which should be tackled first."

Carla smiled before she replied, "The transition from focusing on requirements definition to designing solutions is an important but uncertain step in all projects, and this one is no exception. It's hard to move from a detailed knowledge of what the user wants and needs to a precise blueprint of a system that will satisfy those wants and needs. As you've correctly observed, many important decisions need to be made very quickly, and they overlap. They're also heavily constrained by available time, budget, and existing systems, skills, and infrastructure."

Looking a bit relieved, James replied, "So what's up first, and where do I fit in?" Carla replied, "The next step is architectural design. It's where we'll finalize all of the big-picture decisions, such as what hardware will support the new system, what

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use. Some of these issues were briefly addressed at the start of the project, and some decisions were implicit in the choice of deployment environment and automation scope approved by the oversight committee yesterday. What we need to do now is to lay all of them on the table, make sure they're compatible with one another and with existing systems and capabilities, and parcel out the detailed tasks associated with each."

Carla continued, "I spent yesterday afternoon dividing the work into major categories, including hardware and operating systems, Web support services, database design, application software design, and user interface design. I summarized the choices made so far and the remaining decisions we need to discuss. Key players will meet as a group for the rest of the week to discuss options in each area and develop the system architecture. For example, we'll decide whether to extend our existing database to support the new system or develop a new database with a new DBMS. By the end of the week, we'll have made all of the critical architectural decisions, ensured that the pieces all fit together, and developed plans to tackle each area with personnel assignments and time lines. From that point forward, work in each area can proceed in parallel. Professor Chen told me that you've done an independent study in Web services support software, right?"

"Yes," James replied. "I did a comparative study of infrastructure requirements and communication protocols for Web services using CORBA, Microsoft .NET, and Java 2 Web Services. I did an in-depth technology review of each and visited two sites using each technology to see how they worked in practice."

"Good," said Carla. "That knowledge will come in handy because we need to decide whether to base the new system on Web services and, if so, what supporting infrastructure and development tools to use. I think that you'll learn a lot by working with me for another week or two as we hammer out the architectural design."

Source: J. Satzinger, R. Jackson, & S. Burd, *Systems Analysis & Design in a Changing World*, 5th ed., 2010.

QUESTION 1

a. Based on the case study, at which core process of the system development life cycle is Carla and her team members are at this point of time? What is the objective and main output of this core process?

(6 marks)

b. In the case above, the development team was deciding on using either the existing database, or to develop a new one. Assume that Carla and her team have decided to reuse their existing database. In your opinion, why was this decision taken?

(4 marks)

c. Assume that Carla and her team decided to implement a Web-based production system. Based on this, provide **TWO (2)** guidelines for web browser user interface.

(6 marks)

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d. Secure electronic transactions require a standard set of methods and protocols that address authentication, authorization, privacy and integrity. If the production system connects suppliers and manufacturers via its Web services platform, describe **ONE (1)** Internet protocol that would need to be implemented.

(4 marks)

e. Based on the criteria mentioned in the case, which type of deployment would be most suitable for Carla and her team to take upon? Justify your answer with appropriate arguments.

(10 marks)

(Total: 30 marks)

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SECTION B: ESSAYS

Answer ALL questions.

QUESTION 2

a. Can the terms *computer application* and *information system* be used interchangeably to refer to the same concept? Justify your answer.

(4 marks)

b. Three types of events can be found in the event decomposition technique. Discuss the differences between the *temporal event* and the *state event*. Provide **ONE (1)** example for each type of the event.

(12 marks)

c. Briefly describe **ONE (1)** difference between the *cost-plus-percentage contract* and the *cost-plus-fixed-fee contract*.

(4 marks)

(Total: 20 marks)

QUESTION 3

a. Compare the differences of development and implementation activities between the *traditional waterfall model* and the *spiral model*.

(8 marks)

b. List the **THREE (3)** criteria needed to obtain project approval.

(6 marks)

c. Briefly discuss the following terms based on the Extreme Programming (XP) practices:
   i. Refactoring the code
   ii. Owning the code collectively
   iii. Continuous integration

(6 marks)

(Total: 20 marks)

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QUESTION 4

a. Read the narrative below of a partial process:

> JustOrderThem Sdn.Bhd. is a mail order company that distributes books and magazines to its members. Members are entitled for a 20% discount for their purchases. A customer makes an order via an online order form which is received by the order processing clerk. The clerk then verifies that the sender is a member by checking the member file. If the sender is not a member, the clerk returns the order along with a membership application form.
>
> After the initial verification, the clerk then verifies the availability of the ordered items from the item file. The order items data are then entered into the daily order database. At the same time, the clerk also prints an invoice and shipping list for each order, which are forwarded to the order processing department for further processing.

Develop a **context diagram** and a **logical level-0 DFD** for the above process.

(9 marks)

b. Read the narrative below for cash withdrawal workflow from an automatic teller machine (ATM) of bank XYZ:

> An account holder inserts his ATM card into the machine and enters his personal identification number (PIN). XYZ's server verifies the PIN. If the PIN is valid, the account holder proceeds with entering the withdrawal amount. The amount is checked for sufficient funds against the holder's account. If the fund is sufficient, the server allows the account holder to withdraw the amount requested. At the same time, the amount is removed from the holder's account. The machine then logs the holder's session out before ejecting his card. The holder then takes his card. The machine also follows the same logout process should the holder's PIN is invalid, and if there is insufficient funds in the account.

Develop an **activity diagram** for the workflow described above.

(9 marks)

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c. Read the narrative below that describes an order processing flow:

> As customer orders are received at the Central sales office, the sales clerk enters the orders into the computer. The computer reviews the order, checks the customer's credit (by comparing the credit limit in the Customer master data to the amount of the order plus the balance outstanding on the Accounts receivable master data and the orders outstanding on the Sales order master data) and logs the order on the System log.
>
> After the computer has notified the sales clerk that the order has been accepted, the clerk records the order on the Clerk's log (a manual log book). At the same time, the computer checks for available inventory on the Inventory master data disk and prints a packing slip on a printer located at one of the companies' regional warehouses. As the packing slip is printed, the order is recorded on the Sales Order master data disk.
>
> As orders are processed at the regional warehouses, a Filled Order document is sent to the warehouse supervisor who then enters the order (order number and quantities shipped) into the computer. The computer records the shipment by updating the Inventory master data, the Sales Order master data and writing the Sales journal. The supervisor then files the filled orders (by order number).

Develop a **system flowchart** based on the above narrative.

(12 marks)

(Total: 30 marks)

End of paper